Section 10
Monitoring

10.1 Purpose

The water quality monitoring program can provide information to:

- Evaluate progress in meeting TMDL targets;
- Evaluate the effectiveness of site-specific structural BMPs;
- Assess stormwater contributions to receiving water pollutant loadings and evaluate potential receiving water impacts;
- Identify and prioritize stormwater pollutants of concern; and
- Provide support for stakeholder efforts that result in changes in how monitoring may be done in the future, for example, work with Southern California Coastal Water Research Project (SCCWRP), Stormwater Monitoring Coalition (SMC) and the SQSTF.

The following sections describe the water quality monitoring program that will be conducted during the permit term.

10.2 Monitoring Program

The overall goal of the monitoring program is to provide information regarding compliance with water quality objectives applicable to waterbodies receiving discharges from the MS4. The monitoring program outlined below not only builds on data generated previously, but also refocuses program activities towards the implementation of the MSAR Bacterial Indicator TMDL and the identified key pollutants of concern. This program will be further modified as needed to meet other TMDL monitoring and implementation requirements as these requirements become known.

The monitoring program will be guided by the monitoring design established by the SMC's Model Monitoring Technical Committee (*Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California*, Technical Report #419, August 2004) (Figure 10-1). This approach balances periodic water quality assessments with more intensive studies that are focused on identifying the magnitude and extent of a water quality concern, potential sources, and opportunities for implementing controls.

To meet the goals of the monitoring program, both routine and TMDL-based monitoring activities will occur. The following sections describe the monitoring-related activities that will be implemented within each of these program areas.

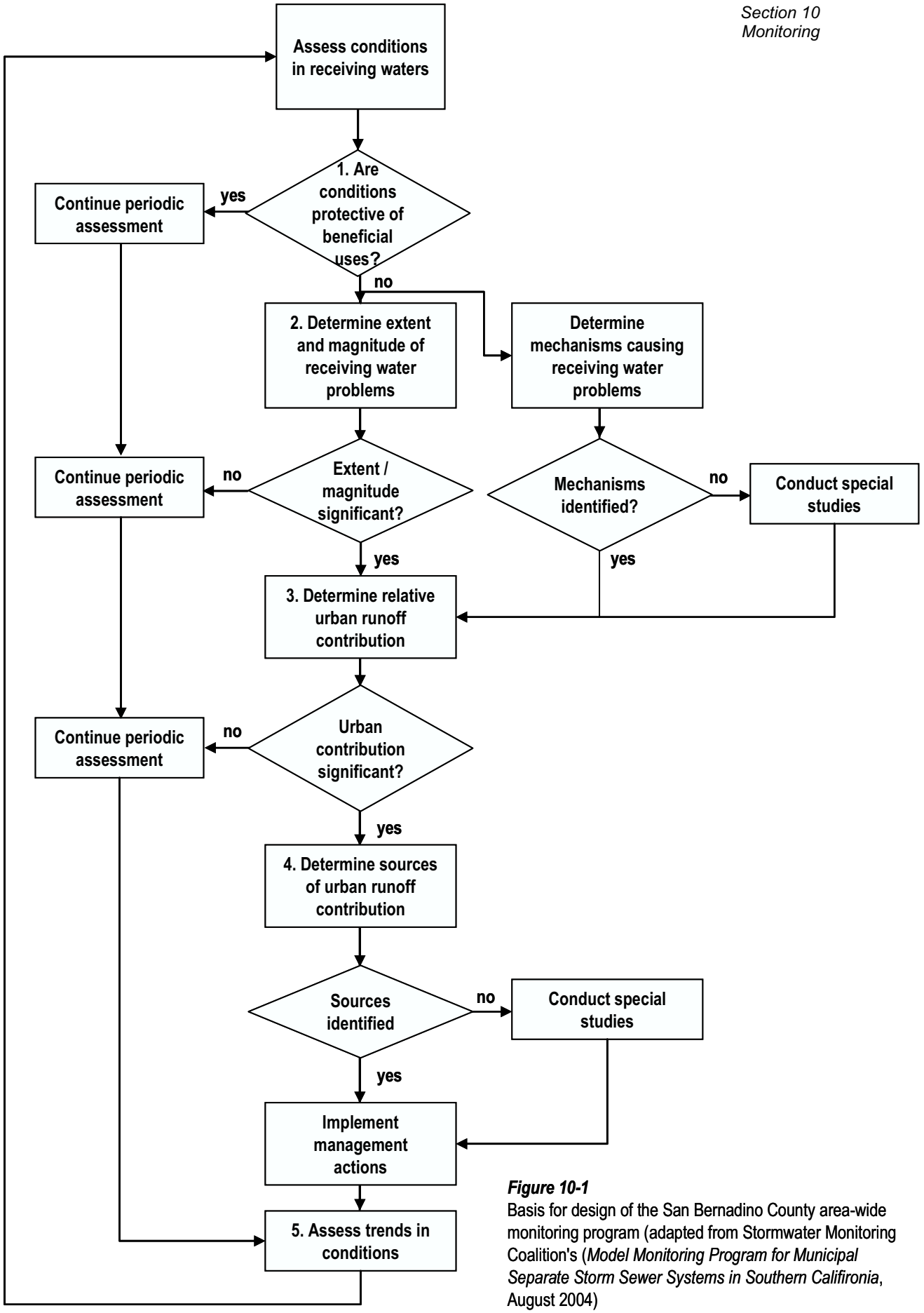

Figure 10-1
Basis for design of the San Bernadino County area-wide monitoring program (adapted from Stormwater Monitoring Coalition's (*Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern Califironia*, August 2004)

10.2.1 Routine Monitoring Program

The following activities will be conducted to support routine monitoring activities conducted to evaluate water quality in the County:

- ***Drainage Area Characterization and Mapping*** - Land use characterization and drainage system mapping efforts will be continued and refined, using the San Bernardino County GIS as a basis. The permittees have authorized a project to create a geodatabase that includes the MS4 system and adjacent natural channels. The objective of this effort is to identify drainage channels that are vulnerable to hydrologic impacts. However, this geodatabase will also serve as a very complete and accessible map of the drainage system.

- ***Receiving Water Monitoring***: Monitoring for key chemical and physical constituents will continue at the sites from which data were collected during the 2002-2007 permit term. All of these sites have been sampled for more than ten years (Table 10-1).

  The water quality data will be used to supplement sampling conducted for the MSAR Bacterial Indicator TMDL, evaluate water quality trends, identify pollutants of concern, and support related watershed management efforts, for example, development of future TMDLs. Receiving water monitoring will be coordinated with other regional monitoring efforts in the local watersheds.

Table 10-1
Routine Water Quality Monitoring Sites

Site No.	Location	Primary Land Use	Nearest District Rain Gauge	Station Number
2	Cucamonga Creek above crosswalls	Open/forest	Cucamonga Canyon at mouth	1309
3	Cucamonga Creek @ Hwy 60	Commercial and Industrial	Ontario Fire Department	1335
5	Stormwater pipe @ Hunts Lane north of Hospitality Lane	Commercial and Light Industrial	District Office	2001B3
8	Santa Ana River @ Hamner Ave.	Urbanized, Mixed Use	Chino Airport	1360
10	Santa Ana River – 6 mi. upstream of 7 Oaks Dam	Open/forest	Santa Ana - Manzanita Flat	3002

Regarding monitoring procedures (including sampling, laboratory analyses and reporting methods), the 2005 Annual Report stated:

> Sampling methods and sample handling procedures used in the monitoring program were generally consistent with procedures described in the Stormwater System and Receiving Waters Monitoring Program

(SBCFCD, January 1993) as amended in the Report of Waste Discharge (SBCFCD, April 1995). The primary differences between the two source documents are the number of storms to be monitored and the use of lower detection limits for selected parameters. Also, consistent with last year's Annual Report recommendations, during FY 2004/05, samples were collected from early, mid-season, and late season storms.

Over the years, certain monitoring constituents have been eliminated due to a preponderance of "non-detect" results. The number of sites monitored on a routine basis also has been reduced following analysis of the accumulated monitoring data. Substantial amendments to the monitoring program proposed in the 2000 Report of Waste Discharge, and recommended in previous Annual Reports are still being evaluated and, in part, have begun to be implemented.

Given the various documents and sources of recommendations for making program improvements, the routine monitoring program would benefit from the preparation of a new monitoring guidance document for the area-wide program. Development of such a document is timely given the need to consider how the monitoring program could be modified to support changing watershed priorities, for example, TMDL development and implementation. Creation of this document would also provide an opportunity to formalize the monitoring concepts developed in the Integrated Watershed Monitoring Program previously submitted to the RWQCB.

- ***Support of Regional Monitoring Efforts*** – The permittees will continue to participate in regional studies or task forces (for example, SQSTF, SCCWRP projects, TMDL monitoring efforts, and BMP effectiveness studies) to coordinate activities such as basin planning, monitoring or special studies.

- ***Special Water Quality Studies*** – Section 3 of the Discharge Characterization prepared for the ROWD identified a priority list of pollutants of concern in the watershed based on the findings of water quality monitoring efforts. These pollutants and their order of priority from high to low were: bacteria, metals (zinc, copper, lead), nutrients (nitrate as nitrogen, total phosphorus), TSS and COD.

  During the next permit term, the permittees will assess each of the pollutants considered a concern (except bacteria, which is already addressed by a TMDL) and prepare a strategic plan for addressing each pollutant. For some pollutants such as the metals, special studies would likely be recommended such as the development of site-specific objectives or total recoverable/ dissolved translators. Where such studies are recommended, they would be implemented as part of the routine monitoring program.

- ***Bioassessment*** – The permittees will select appropriate stream sites and initiate bioassessment activities in consultation with SCCWRP and the SMC.

10.2.2 TMDL-based Monitoring

The following activities will be implemented in support of requirements established in the MSAR Bacterial Indicator TMDL:

- ***Watershed Monitoring*** - The permittees will work with other TMDL-affected parties in the MSAR watershed to develop and implement a RWQCB-approved watershed-wide monitoring program consistent with TMDL requirements to provide the data necessary to review and update the MSAR Bacterial Indicator TMDL as well as evaluate compliance with TMDL targets.

- ***Urban Source Water Evaluation Plan (USEP)*** – The permittees will work with other TMDL-affected parties to develop and implement a Bacterial Indicator USEP as required by the MSAR Bacterial Indicator TMDL.

As other TMDLs are approved within the area covered by the MS4 Permit, the permittees will implement the monitoring-related requirements established by each TMDL.

10.2.3 Participation in Regional Activities

A number of regional activities or organizations continue work in the Santa Ana River Watershed area, including the SQSTF, SMC, SCCWRP, and regional universities. Participation in water-related studies or planning efforts, which may include monitoring, provides valuable information for the area-wide monitoring program.

A key example is the ongoing work by the SQSTF. The Task Force is preparing recommendations for changes in the Basin Plan that will affect the applicability of REC-1 and REC-2 use designations, modify the water quality objectives for bacteria, and establish an acceptable methodology to refine or reclassify recreational uses in the basin. Once this methodology is established, it may be used by the permittees to evaluate and, if appropriate, reclassify recreational uses. The District is an active participant in this Task Force, and once completed the outcome of the effort could affect how and where bacteria monitoring is done within the area covered by the MS4 Permit.

As part of its regular activities in implementing the monitoring program, the Principal Permittee will continue to participate in regional activities.

10.2.4 Reporting

Annual reporting of monitoring results will include the following elements:

- ***Pollutants of Concern Identification*** - The stormwater discharge and receiving water quality monitoring data will be used in conjunction with GIS-based mapping information to identify pollutants of concern. This evaluation will involve assessing the monitoring results in the context of regulatory objectives, benchmarks and other concerns within the watershed and using this assessment

to prioritize program activities. Examples that may be used to identify and prioritize pollutants of concern include:

- Pollutants listed as causes of impairment on the 303(d);
- Stormwater pollutants that may cause or contribute to exceedances of Basin Plan or California Toxics Rule objectives;
- Pollutants that exceed USEPA benchmarks established in the Multi-Sector General Permit for industrial facilities; and
- Pollutants known to be of significant local or regional public concern.

- ***Data Analyses*** - Monitoring data will be analyzed using appropriate techniques to assess trends, evaluate compliance with water quality objectives and evaluate the long-term effectiveness of the area-wide stormwater program. Data analyses will be completed annually to support annual reporting requirements and periodically, as needed, to support TMDL reporting requirements.

10.3 Performance Commitments

The permittees propose to implement the following performance commitments to implement the monitoring program elements:

10-1. As needed to support the County's area-wide stormwater program, the permittees will continue to participate in regional activities to coordinate their program with activities such as basin planning, task forces (for example the SQSTF and TMDL development), monitoring, or special studies.

10-2. As needed, the Management Committee will develop area-wide guidelines for use by the permittees if any permittee chooses to implement SQSTF findings. Development of such guidelines will help ensure that any effort to modify recreational uses on waters within the MS4 Permit area is coordinated among affected permittees.

10-3. The permittees will participate in the Integrated Stream Bioassessment Monitoring Program led by the SMC.

10-4. Update, periodically, the GIS-based mapping of drainage area information, including drainage system facilities, land uses, and receiving waters.

10-5. Continue to implement the routine stormwater monitoring program at the sites identified in Table 10-1 to characterize stormwater quality at both stormwater monitoring and receiving water monitoring sites.

10-6. In coordination with other TMDL-affected parties, develop and implement:

a. RWQCB-approved watershed-wide monitoring program consistent with the MSAR Bacterial Indicator TMDL requirements.

b. Bacterial Indicator USEP as required by the MSAR Bacterial Indicator TMDL.

c. Other TMDL requirements established within the MS4 Permit area during the permit term.

10-7. Prepare a strategic plan for each of the pollutants of concern identified in the ROWD to determine if any additional studies or actions are needed to address the potential concern. One or more strategic plans will be prepared that address zinc, lead, copper, nitrate as nitrogen, total phosphorus, total suspended solids and chemical oxygen demand. The result of this effort may be a recommendation to remove the constituent from the pollutant of concern list.

10-8. Prepare an updated monitoring program guidance document for the area-wide program to (a) document all current sampling, laboratory, data analysis and quality control/quality assurance procedures used in the monitoring program; and (b) ensure that the monitoring program is consistent with state Surface Water Ambient Monitoring Program requirements.